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ABSTRACT

Activities and games which use dominoes to reinforce basic arithmetic skills are presented. Instructions and materials are provided for the activities and games, most of which involve addition and subtraction. Other skill areas which are covered include recognition and matching of domino patterns, multiplication, and division. A seven-item list of resources cites two contact persons, one journal article, and four books. Two reproducible pages provide examples of 55 dominoes, with patterns ranging from zero through nine spots on each half of the domino. (DC)

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MATH "DOMINOES"

Starring the

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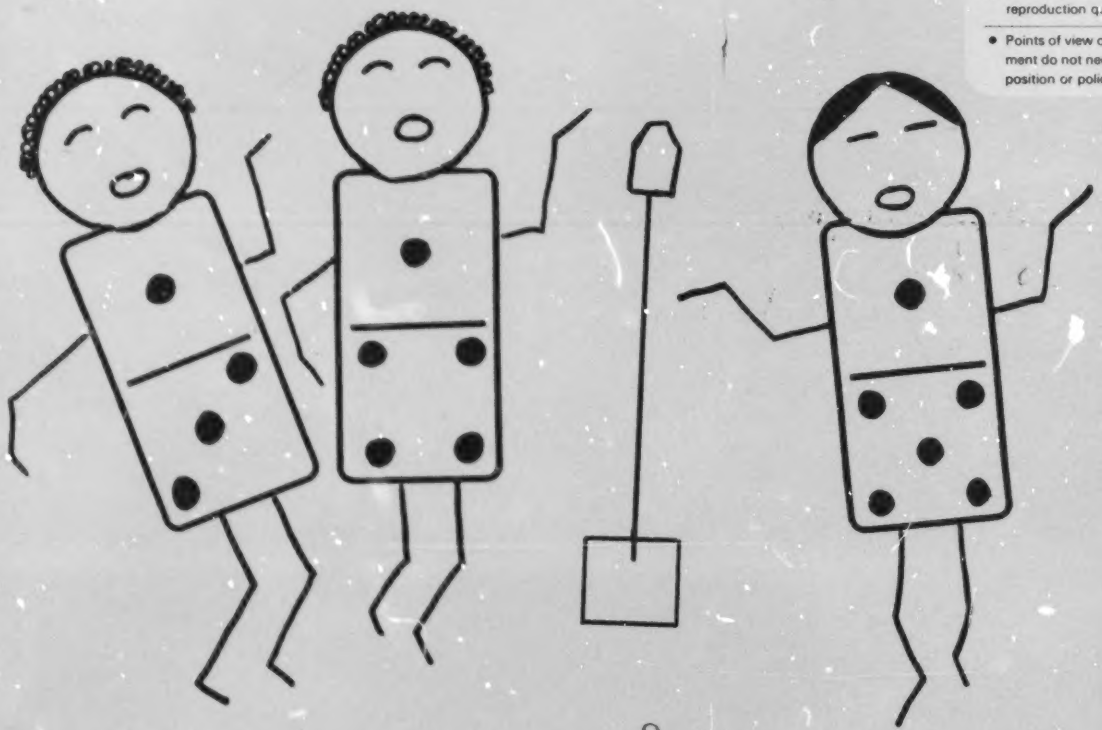

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DES MOINES INDEPENDENT SCHOOL DISTRICT

1800 Grand Avenue

Des Moines, Iowa 50307

"MATH STARRING THE DOMINOES"

Joie Gronert
Sally Marshall

Activities using dominoes designed to reinforce basic facts and to stimulate strategic thinking for problem solving. (Grades 1 - 4)

Title I Elementary Mathematics Program

1979

Recognition of Domino Patterns

Children shall learn to recognize the domino patterns at a glance.

(1) A bingo type game matching numeral to pattern and pattern to numeral

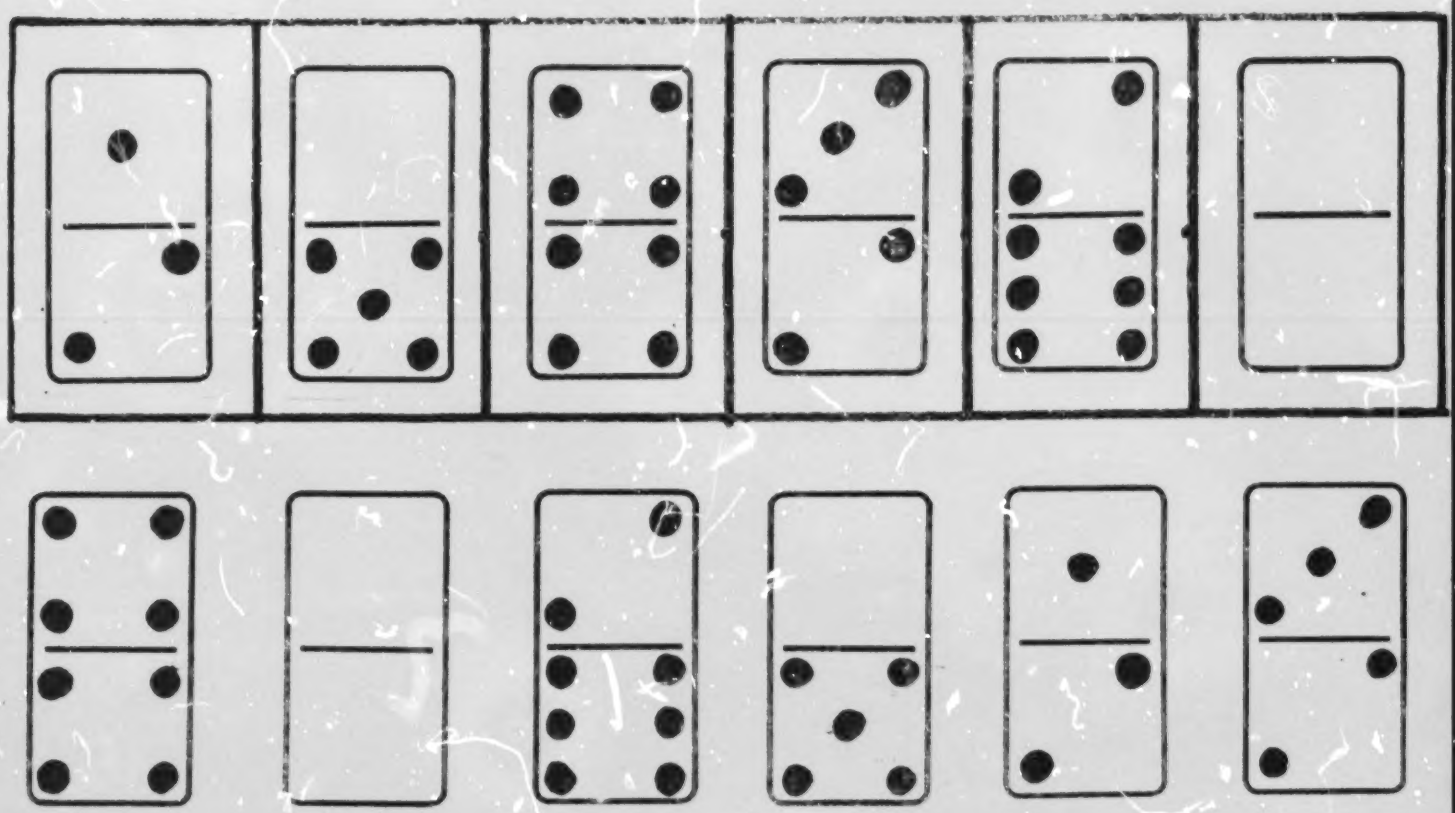
(2) Flash cards

(3) Children construct their own domino pattern cards (perhaps using gummed circles)

Matching Domino Patterns

Domino chains are made by matching one half of one domino to a half of another domino. The object is to use up all of the dominoes or to continue until no more can be played. As a game, each person would select a certain number of tiles (eg.7). Player with highest double starts the game. In turn, each person makes a match. If that is not possible, dominoes are drawn from the stock until a match can be made. Play continues until a player uses all his dominoes or no matches can be made by any player and the stock is gone.

A beginning activity would have the children match dominoes to a board on which some dominoes are shown.



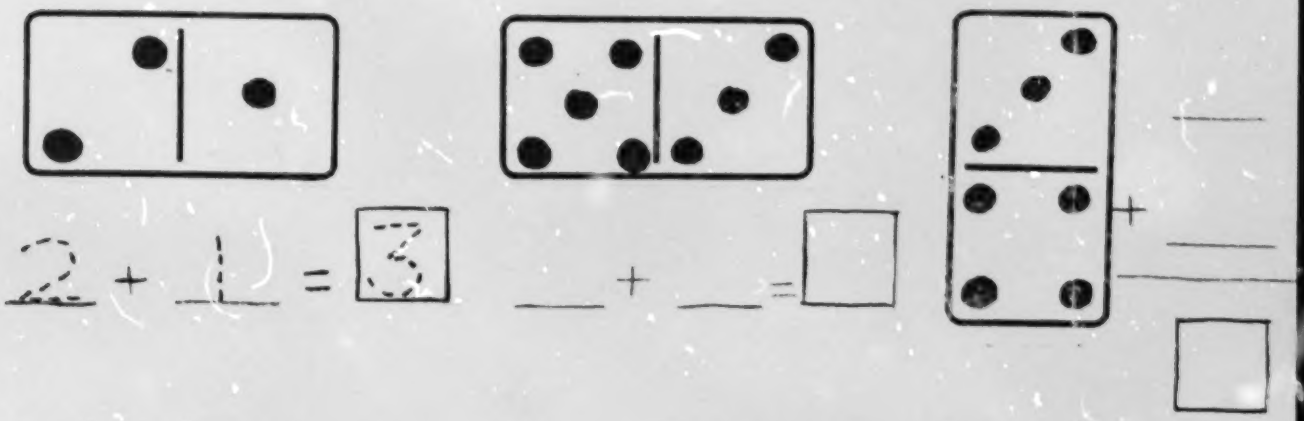
Given a set of double-six dominoes, a child will try to match a domino to a two square pattern, horizontally or vertically, on the playing board. Once the domino has been placed, it cannot be moved. Play continues until no more dominoes can be used. The score is determined by the number of squares uncovered. The object is to have the lowest score. Figure 1

This same game can be played with numerals in the squares. Figure 2

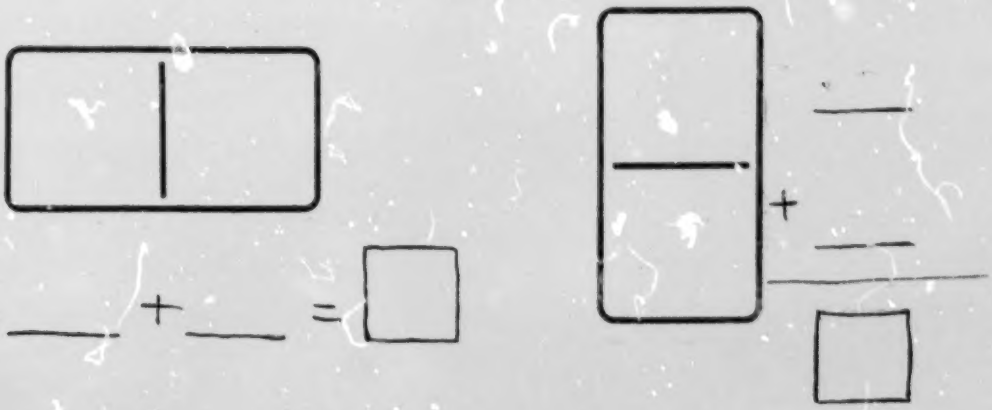
Children might enjoy constructing their own game boards. Figure 3

Addition and Subtraction

Provide a worksheet with drawings of dominoes. Match the correct domino. Record the number of spots on each half and the total.



Place a domino in each space. Record the number of spots on each half and the total.



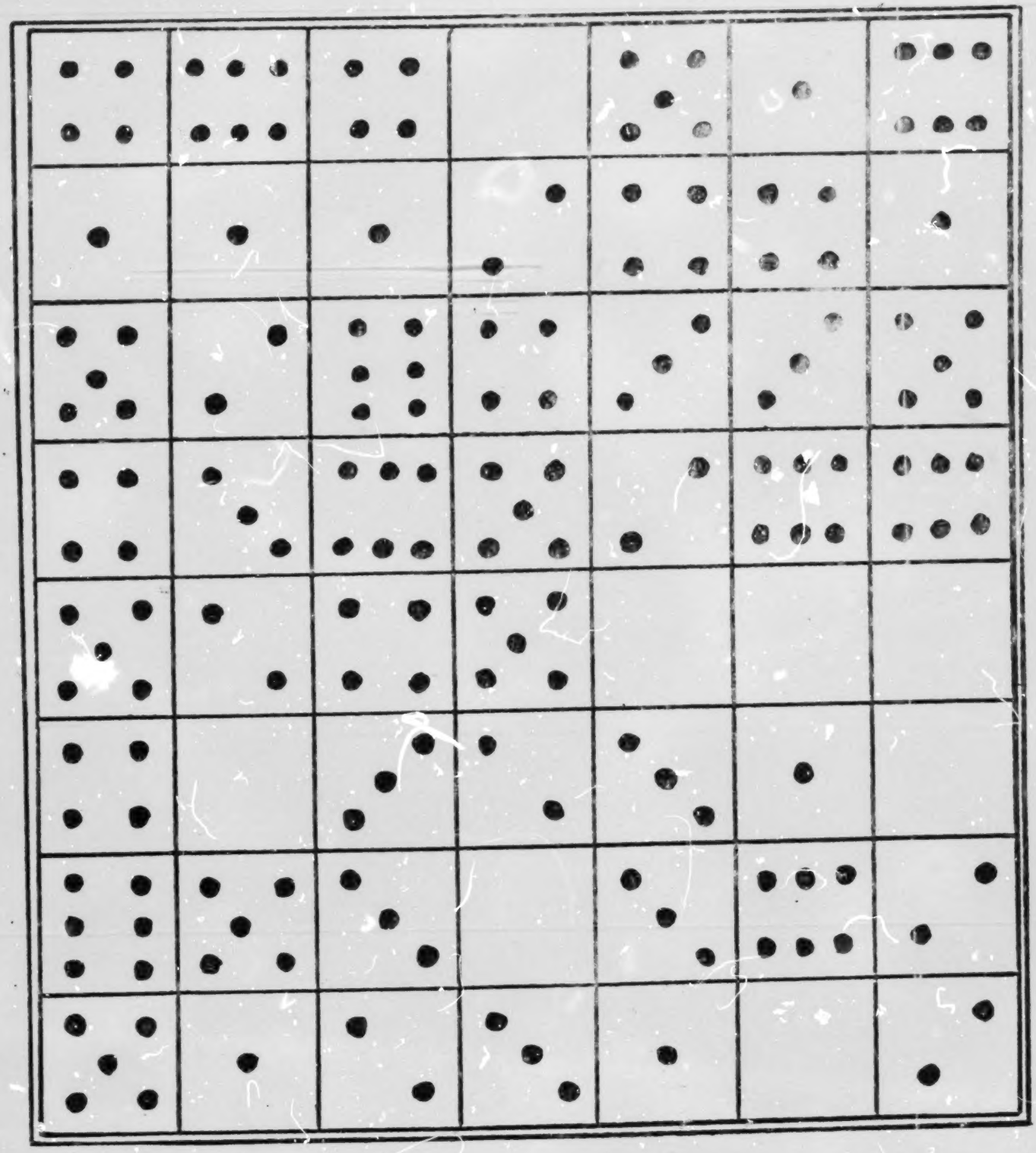
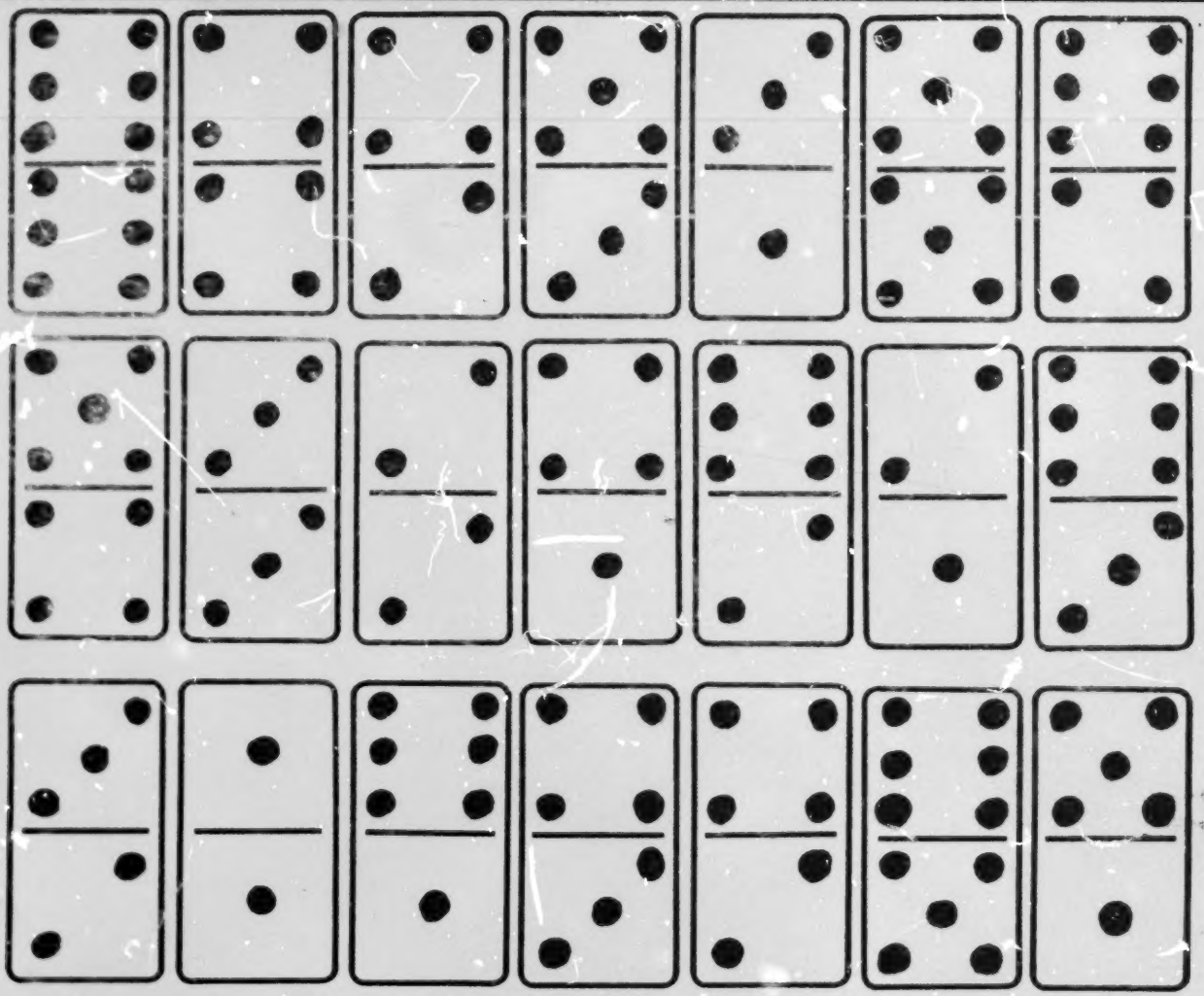


Figure 2

3	4	3	4	0	6	3
6	6	5	5	5	1	0
5	1	0	4	4	2	4
1	6	0	0	3	2	1
6	4	6	5	2	1	3
2	2	0	5	0	5	4
3	0	6	1	4	2	6
2	5	2	1	1	3	3

DOMINO BLOCK OUT



YOU WILL NEED: 2 DICE, MARKERS, AND A GAME BOARD FOR EACH PLAYER

DIRECTIONS:

1. EACH PLAYER TAKES TURNS ROLLING 2 DICE. IF THEY ROLL A COMBINATION THAT APPEARS ON THE DOMINO THEY COVER THAT COMBINATION WITH A MARKER.
2. IF A COMBINATION IS ROLLED THAT DOES NOT APPEAR OR WAS PREVIOUSLY COVERED THAT PLAYER LOOSES A TURN.
3. THE FIRST PLAYER TO COVER HIS OR HER GAMEBOARD IS THE WINNER.

G. LOWE and E. JAVOR

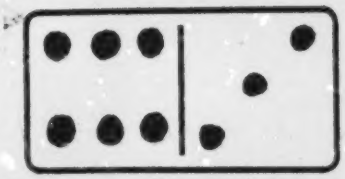
Find a different domino to fit each sum. Write the problem.

___ + ___ = 7

___ + ___ = 7

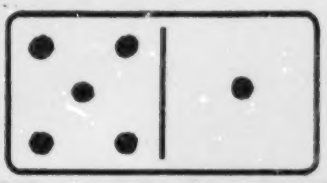
___ + ___ = 7

Provide a worksheet with drawing of dominoes. Match the correct domino. Record the total number of spots and subtract one of the numbers. Extend to include the family of facts.



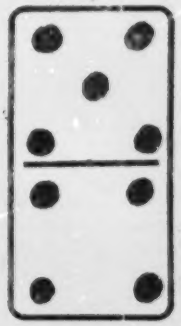
9 - 3 = ☐

9 - 6 = ☐



6 - 1 = ☐

6 - 5 = ☐



9 - 4 = ☐

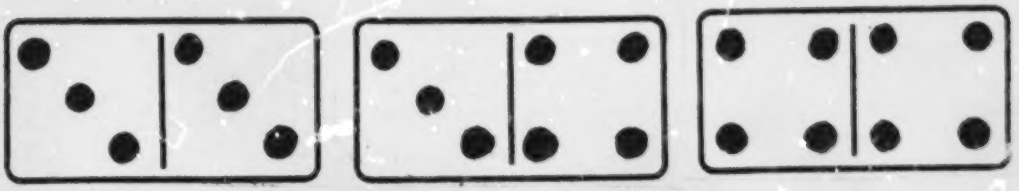
9 - 5 = ☐

Given the "difference" the child will find a domino that will work for that problem. The child will record the number sentence.

__ − __ = 5

__ − __ = 4

Given a row of 3 dominoes, which of the following numbers of spots can you show by using one to all of the squares in an unbroken row.



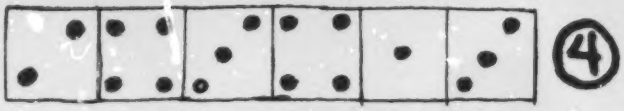
Circle the numbers you can make.

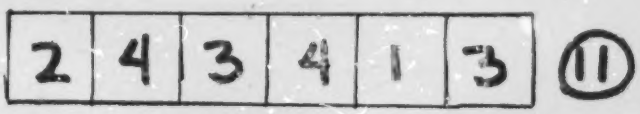
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

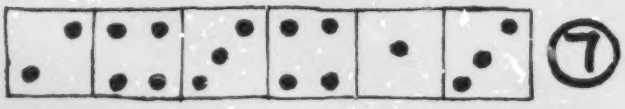
To vary this activity

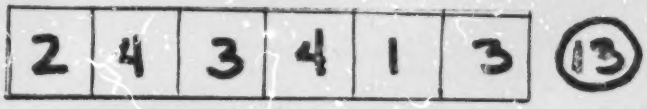
(1) Own domino chain could be selected - as few as two dominoes could be used. More dominoes could be used for a more challenging activity.

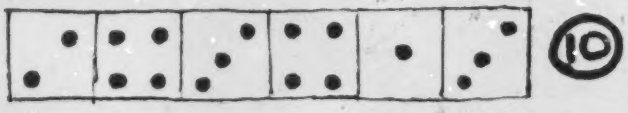
Given a row of three dominoes, circle the squares needed to cover the sum at the end of the line.
Remember that all squares must be next to each other.
A variation would use numerals instead of domino dots.



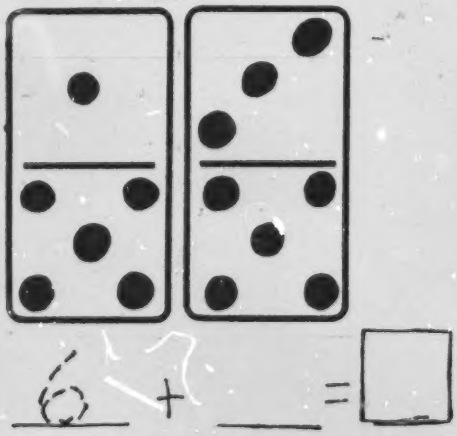


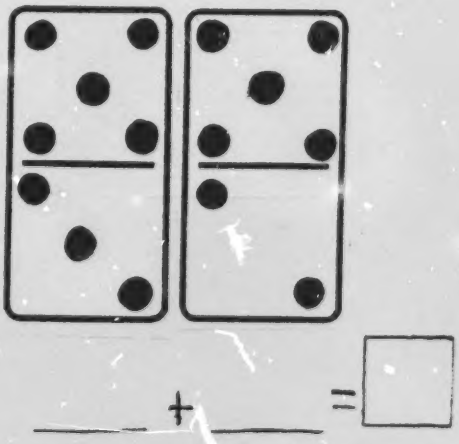






Record the number of dots in each domino, then the total of both.

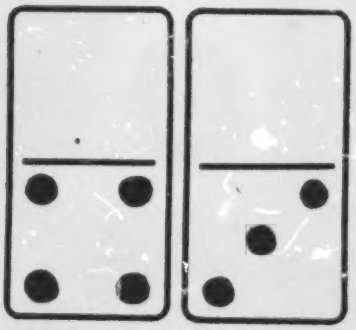


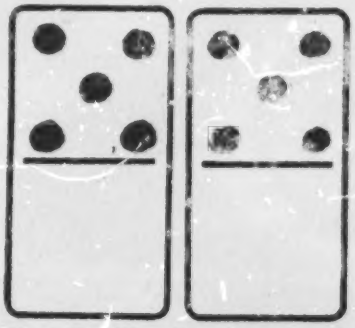


Given the total spots for each domino, the child must fill in the missing spots.

- or -

Given the total spots for both dominoes and the spots for one, the child must first find the total for the other domino, then the missing spots of each domino.





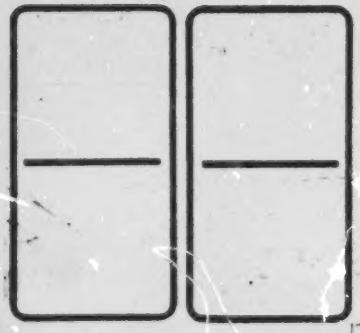
7 + 8 = ☐

8 + ___ = 17

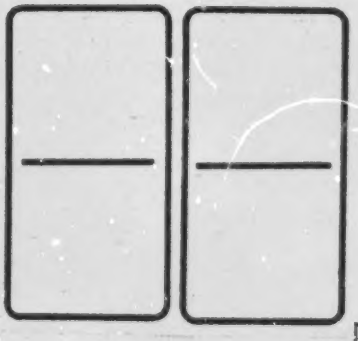
Given the "addends" of the problem, the child must find the "sum" and the dominoes that will make the sentence true.

- or -

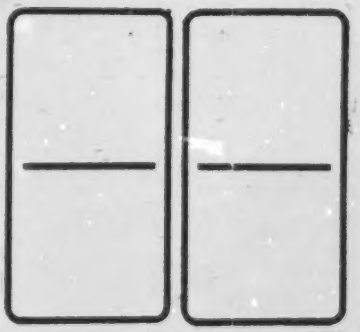
Given the "sum" of the two dominoes, the child must choose the dominoes that will have their total spots equal the sum. They must also complete the number sentence.



10 + 4 = ☐



9 + 6 = ☐

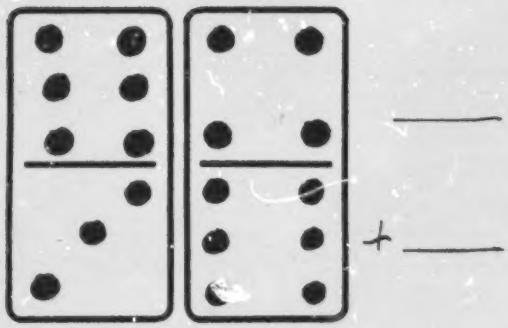


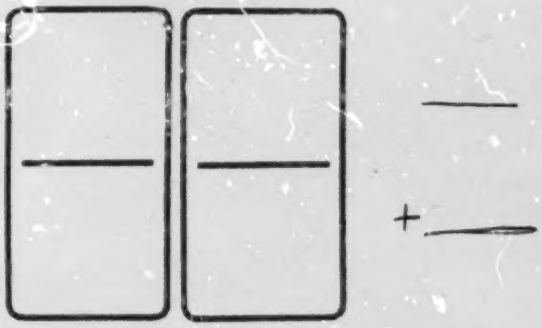
___ + ___ = 18

Given two dominoes, the child will add the spots of each domino vertically and horizontally. Then record the sum (It should be the same both ways).

- or -

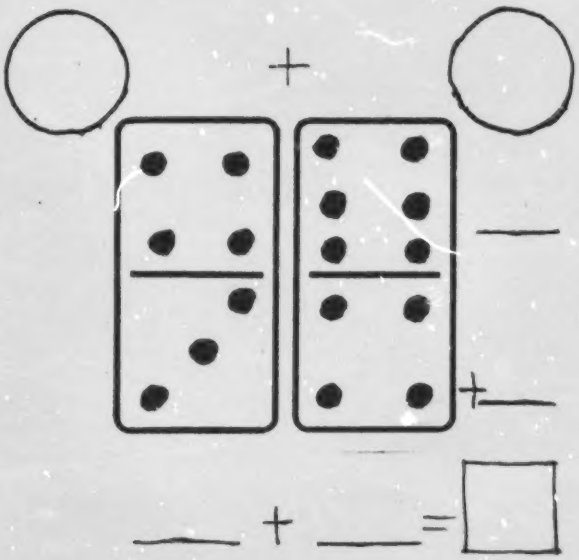
Given a sum, the child must find two dominoes that have the total spots needed. Then the child records the number sentences (both vertically and horizontally).

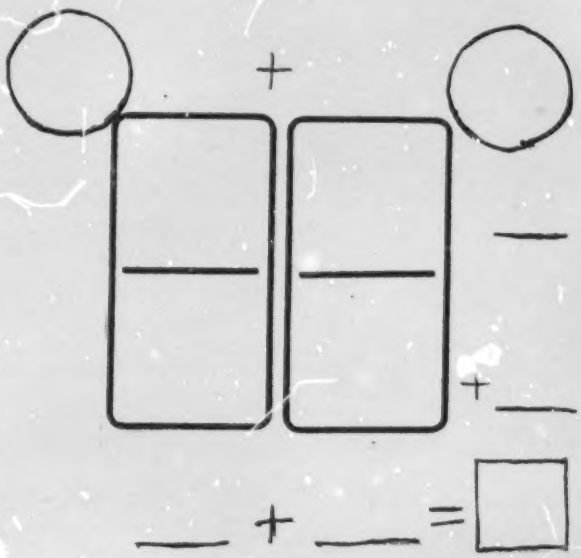




This activity can be extended to three dominoes.

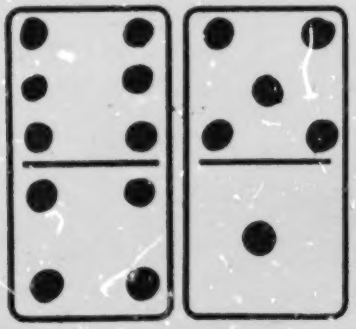
Given two dominoes, the child records the spots horizontally, vertically and diagonally. The child then adds the number sentences. All should have the same sum. The child can construct his own problems as well.





Given two dominoes, the child records the number of spots on each domino vertically then subtracts the small from the larger amount.

This activity can also be done horizontally.



$$\begin{array}{r} 11 \\ -\ 5 \\ \hline 6 \end{array}$$

$$10 - 6 = 4$$

DOMINO SUM BINGO

2 - 5 players per set of dominoes

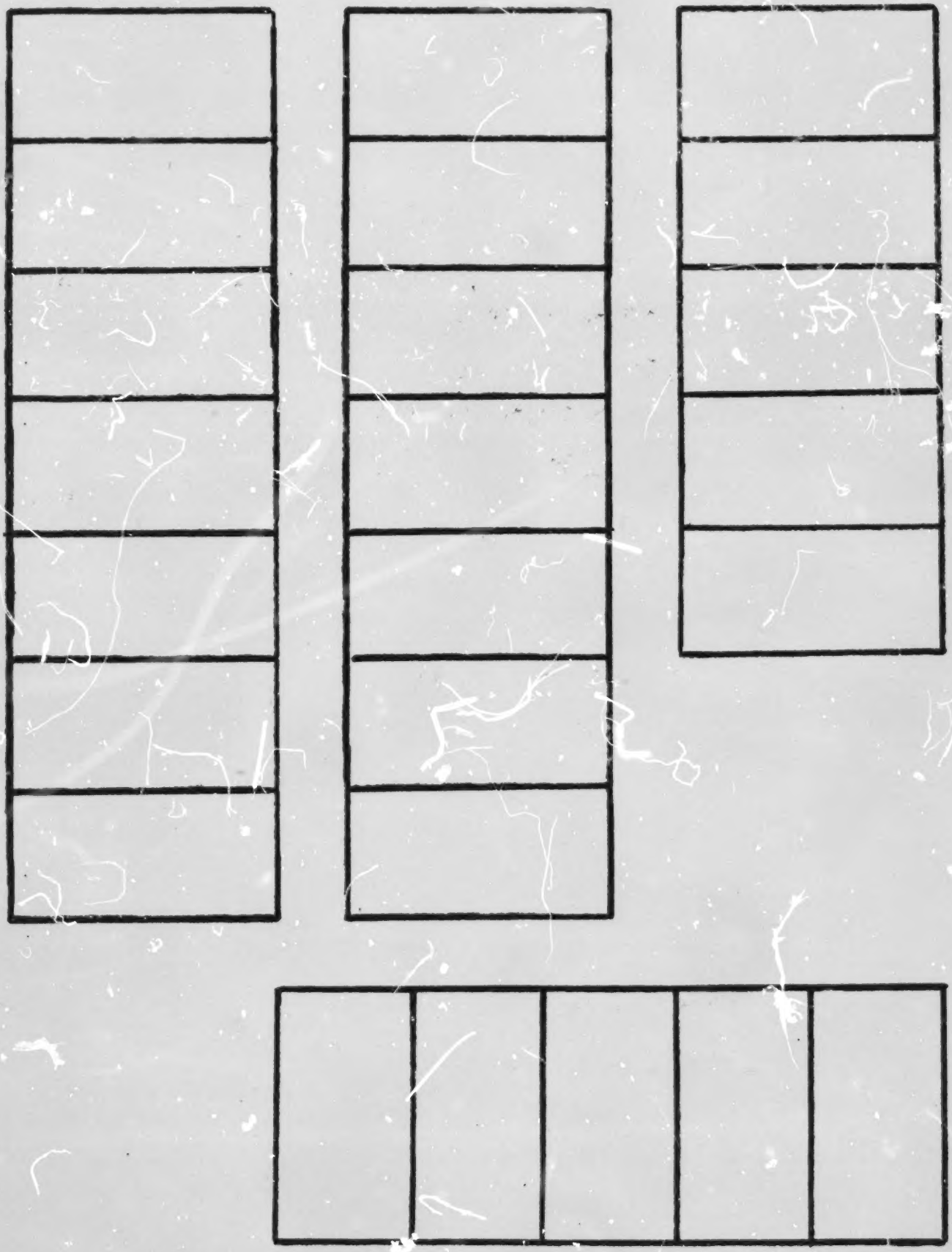
Place all the dominoes face down. Each player draws 5 dominoes and places them in a row in front of him (it doesn't matter if they are seen by others). The leader (or "caller") picks a sum card from the deck and calls out the sum. If any player has a domino whose two sides equal that sum, he turns it over. The winner is the first player to turn over all his dominoes.

To make your sum calling cards, just take the set of dominoes you wish to use and go through them, putting the sum for each on a card.

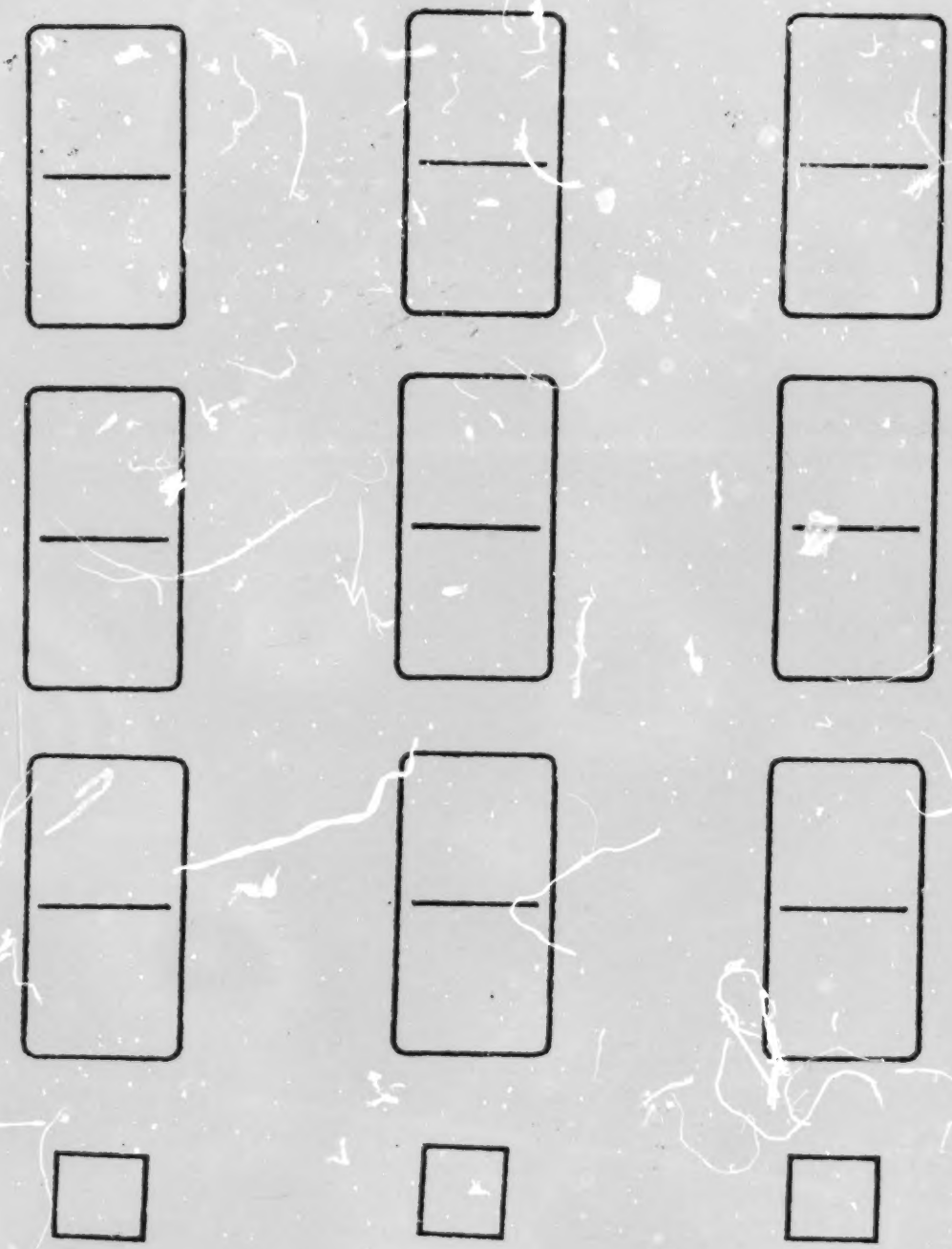
Variations

Use products of the two halves of the dominoes, and product calling cards.
Use sums plus one (or more)
Use sums minus one
Products plus or minus one
Products plus sums
Products minus sums

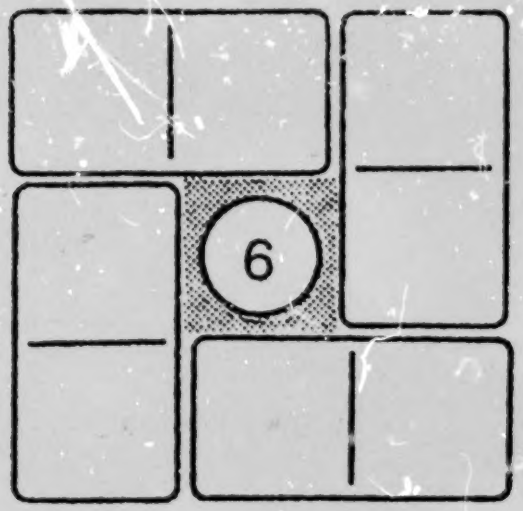
Domino Bingo Playing Boards

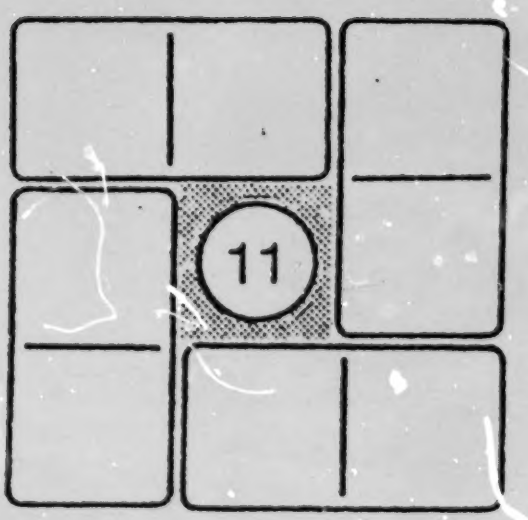


SELECT DOMINOES SO THAT EACH COLUMN HAS THE SAME SUM.



PLACE DOMINOES IN EACH SPACE SO THAT THE SUMS BOTH HORIZONTALLY AND VERTICALLY ARE THEY SAME AS THE NUMBER SHOWN IN THE CIRCLE.

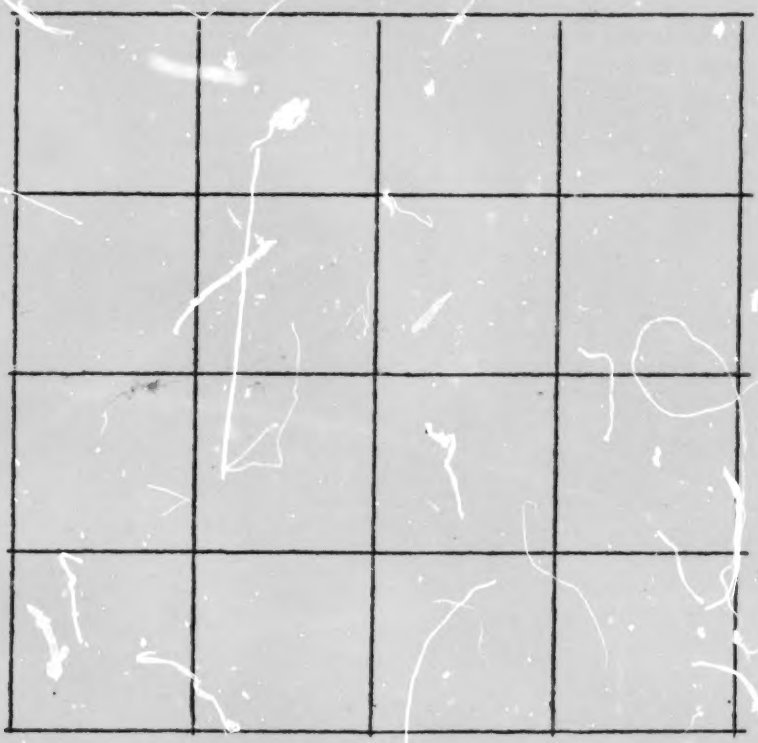




3-4	2-2	4-0	6-4
5-5	4-5	3-5	1-3

PLACE THESE DOMINOES ON A 4 X 4 GRID LIKE THE ONE SHOWN BELOW.

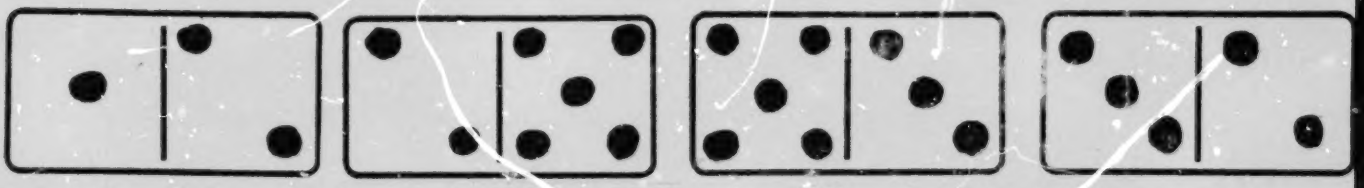
THERE SHOULD BE A TOTAL OF 14 DOTS IN EACH ROW AND IN EACH COLUMN.



General Rules For All Games

Dominoes must be placed by these rules:

1. Dominoes are placed end to end, except the doubles, so that the joining squares have the same number of spots.



2. A double is placed at a right angle to a domino that has already been played. Each half of the double must match the end of the domino already played.

3. Dominoes may be placed on any exposed end. Each double increases the number of exposed ends by one.

To start play, place all dominoes face down and mix well. Each player chooses seven dominoes. Then a domino is drawn from the pile and placed face up on the table.

The order of players is also decided.

Addition Domino

1. The first player tries to match one of his dominoes with the domino in place. If the child can play a domino, his score on that turn is the total number of spots on the domino played. If no domino can be played, the child must draw from the pile until one can be played.

2. Each player on his turn continues in the same manner, playing one domino and recording the score.

3. The game ends when one player uses his last domino. The player receives a ten point bonus to his score. All others must subtract the total number of spots on the dominoes still in their hands from their score.

4. The player with the highest score wins. A match may consist of one or more games with the highest cumulative score determining the winner.

Variations

1. Score on each play is the sum of the spots on the domino played and the spots on the domino against which it was placed.
2. Score on each play may be the total number of spots on all exposed ends.

Multiplication Domino

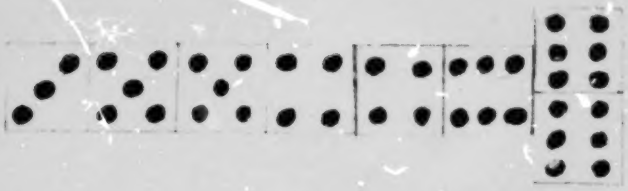
Play is similar to Addition Domino except the score is the product of the number of spots in the two squares of the domino played.

Variations

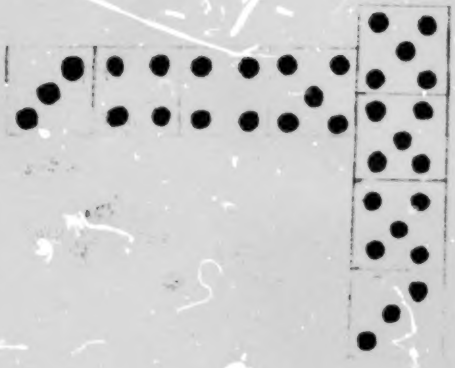
1. The score on each play is the product of the number of spots on the domino played and the spots on the domino against which it was placed.
2. The score is the product of the number of spots on each square of the domino played plus the number on the domino against which it is played.

Adapted from a presentation at the 57th Annual Meeting of the National Council of Teachers of Mathematics in Boston, Mass. by Patty Woodson, Teacher Specialist at Meadows Elementary School, Conejo Valley Unified School District.

Domino games can be scored in many different ways.



Player 1	Player 2
6 + 6 = 12	4 + 6 = 10
5 + 4 = 9	5 + 3 = 8
21	18



Player 1	Player 2
5 x 4 = 20	5 x 5 = 25
5 x 3 = 15	4 x 3 = 12
35	37

POLKA DOTS - A Solitaire Addition Game

1. Place the dominoes face down on the table and mix them up.
2. Draw six dominoes and lay them face up in a row. Leave the rest for drawing later.
3. Study the row of six to see if there are any two dominoes that all together have twelve spots. Take those two out.
4. Replace the two you took out by drawing two from the pile.
5. Look again for two dominoes that total twelve and discard and replace them. Keep doing this and filling the row of six.
6. If you are able to discard all of the pieces in the set, you win. But if you have a row where no pair totals 12, you lose. You can never have more than six pieces in the row.
7. When you have won a few times with a row of six pieces, try a row of five dominoes, then one of four. You will find these much harder to win.

Variation

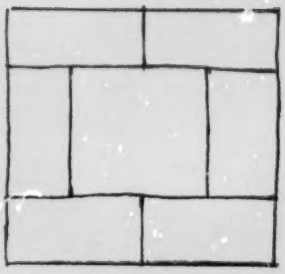
Can also be played with a double-nine set with the pairs totaling eighteen.

FAIR LUCY - A Solitaire Addition Game

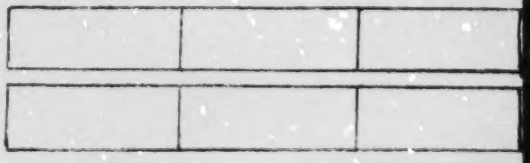
1. Place the dominoes face down and shuffle well.
2. Lay out a row of seven pieces, face down.
3. Cover these with another row of seven tiles, and then cover those with still another row, all face down.
4. Finally, put the last seven pieces on top, face up. Now you will have a row of seven piles, each pile four pieces high, with the top seven pieces face up.
5. If any two dominoes that are face up have a total of twelve pips, discard them and turn face up the pieces underneath them. This will again leave seven pieces face up. (You must never have more than seven pieces face up.)
6. Remove another pair that totals twelve, if there is one, and again turn up the two pieces underneath.
7. If you can continue in this way until you have discarded all the pieces, you win. If no two pieces with twelve pips appear, you lose and will have to start over again.
8. If you remove the bottom piece from a pile, the space must remain empty; you may not move a piece from another pile to the space.

SOME PUZZLES FOR THE DOUBLE - 2 SET

1. A Square - a matching puzzle
   Arrange the six pieces of the Double - 2 Set in the square shown so that all the joins match in number.

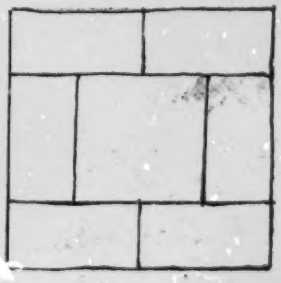


2. Two Lines
   A very simple Double - 2 puzzle is to form two lines of three pieces each so that each line contains the same number of pips The joins must match in number.



3. An Equilateral Triangle
   Form the triangle with the Double - 2 set so that each on the three sides contains the same number of pips. It is not possible for all the joins to match, so let's make none of the joins match.

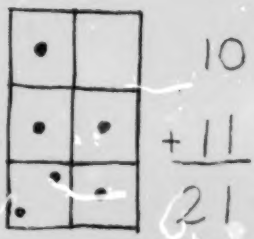
4. A Square
   Arrange the six pieces of the Double - 2 set into square shown so that each of the four sides contains the same number of pips.

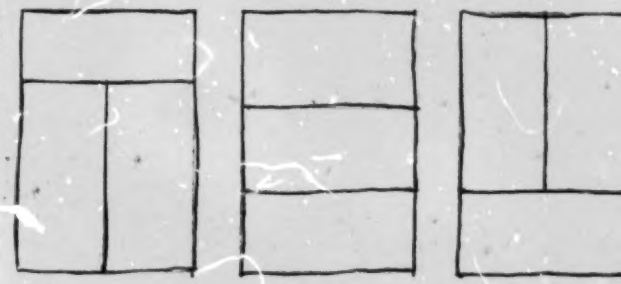


5. A Rectangle
   Arrange the six pieces of the Double - 2 set into a rectangle like the one shown. Arrange them so that each of the four sides contains the same number of pips.

6. Simple Addition

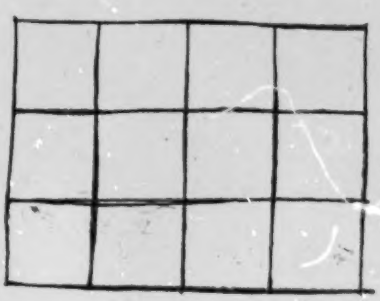
Three dominoes have been arranged here, using each half-tile as a digit, in the form of an addition problem (10 + 11 = 21). You are to form two such additions using all six pieces of the Double - 2 set. The two sums need not be the same, and you may arrange the three pieces of an addition in any of the three possible ways shown. Your first two arrangements need not be alike. Keep in mind that a zero may not be placed in the left-hand column.





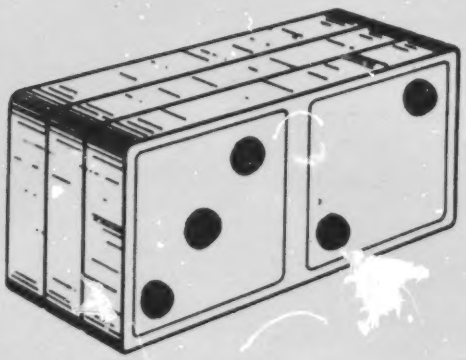
7. Magic Rectangle

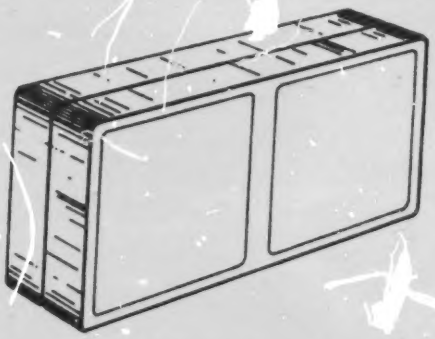
Arrange the six pieces of the Double - 2 set to form a 3-by-4 rectangle of half-tiles. You are to arrange the set so that the number of pips in each of the three rows is the same and the number of pips in each of the four columns is the same. The two numbers will be different, of course. You must keep to the 3-by-4 rectangle, but within that form you may lay any of the pieces either horizontally or vertically.



Multiplication and Division

The child counts the number of spots on the front domino. All other dominoes in the stack are like the front one. The child adds the spots for the front domino with the spots from the other domino (es). An addition and a multiplication equation can be written from the domino.





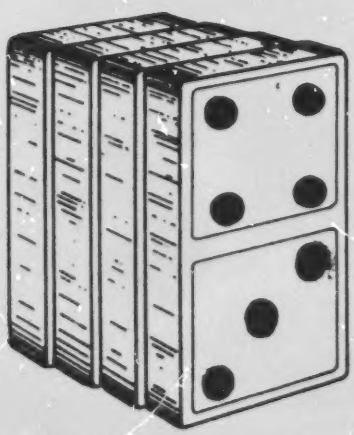
5 + 5 + 5 = 15

3 x 5 = 15

___ + ___ = ___

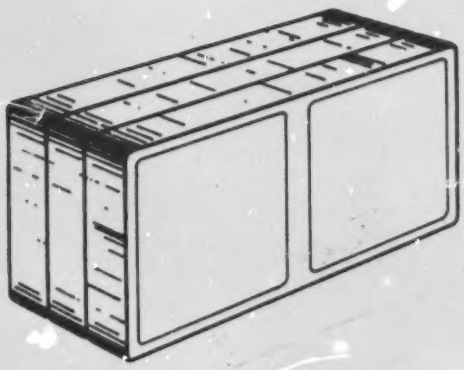
___ X ___ = ___

Find the total spots on the front domino. Record. Multiply these factors to find the product.



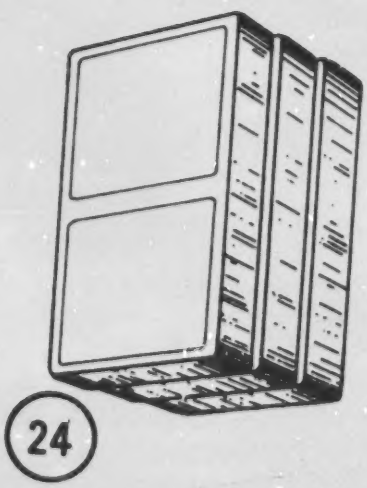
___ X ___ = ___

Count the number of dominoes in the stack. Record. "What times this factor equals the product?" Fill in the missing factor and the possible domino for it.



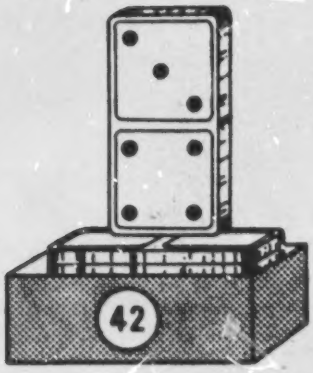
___ x ___ = 27

Given the total number of dots (in the circle) divided by the number of dominoes in the stack, the child will find the number of dots on each domino and make a possible domino pattern.



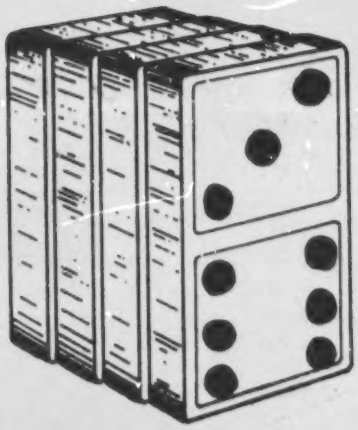
___ ÷ ___ = ___

Given the total number of dots divided by the number of dots on each domino, the child will find the number of dominoes in the stack.



number of dominoes

All the dominoes in the stack are like the one pictured but one. Given the total number of dots and the number of dominoes in the stack, the child will find the number of dots on the unlike domino.



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The unlike domino has

_____ dots.

Sources:

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and

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